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A Lost Generation?
Long Term Socioeconomic Outcomes in Orphans

Carlos Bozzoli

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Abstract

Previous research on orphanhood has established that parental death has a negative effect in terms of school enrollment and grade progression, but the relation between orphanhood and socioeconomic outcomes in young adults has been largely ignored in the literature. In this paper, I use a longitudinal survey from the city of Cape Town, South Africa to evaluate two main outcomes of young adults, namely labor market attachment and fertility, and its relation to orphanhood status. The uniqueness of this dataset lies within the combination of different survey waves with a year-by-year life history that records key outcomes (e.g. schooling, work, fertility outcomes). It also provides information on so-called "parental investments" (time and material support), family background, and literacy and numeracy test scores. I find that although preexisting parental background characteristics and literacy and numeracy skills are comparable between orphans and non-orphans, the latter are less likely to be employed (true primarily for males) or to have children (females) early in their lives. Evidence is mixed regarding whether orphans earn lower wages than non-orphans. These results suggest that orphanhood may not only alter educational achievements, but that it may also leave a long-lasting "imprint" in terms of employment and fertility patterns.

JEL Classification: J12, J13, J22, O12.

Keywords: Orphans, employment, wages, fertility, parental investments.

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1. Introduction

More than 2 million South African children under age 17 have lost one or both of their parents (UNAIDS/UNICEF/USAID, 2004). These statistics are common for sub-Saharan African countries, where 43 million children were orphans as of 2003, with many of their parents passing away in their prime age. Although a large fraction of these orphans are taken care of by their extended family or by a surviving parent (Monasch and Boerma, 2004), this may not be enough to keep at parity with non-orphans. Indeed, evidence coming from longitudinal studies in low-income regions shows that parental loss during childhood significantly decreases enrollment rates and schooling outcomes (Case and Ardington, 2006, Evans and Miguel, 2007).

If orphans are lagging behind in school after their parents die, do they "bounce back"? This concern about potential long-lasting effects stemming from parental death cannot be easily disregarded. There are different channels through which disadvantages early in life may persist over time. For example, given that depressed educational outcomes substantially reduce income generation possibilities in adults (Card, 1999, Duflo, 2001), it is possible that the current educational disadvantages in orphaned children could later result in lower wages or poorer employment outcomes. However, more research is needed to substantiate this and other claims.

In this paper, I use a longitudinal survey from the city of Cape Town, South Africa to evaluate two main outcomes of young adults, namely labor market attachment and fertility, and its relation to orphanhood status. The data comes from the Cape Area Panel Study (CAPS), which was carried out to study the multiple dimensions describing the transition of adolescents into adulthood in urban Cape Town, the second

most populous city in South Africa. The uniqueness of this dataset lies within the combination of different survey waves with a life history calendar that records schooling, work, and fertility outcomes, as well as living arrangements for every year the young adult has lived since birth. Additional information on so-called "parental investments" (time and material support), family background, and literacy and numeracy test scores are also included. These features make it a rich source of data to understand fertility and labor market attachment for young adults in light of conditions earlier in life, and specifically to test for long lasting effects associated with parental death. Furthermore, CAPS allows me to distinguish whether third factors (such as parental background and parental investments earlier in life) may be driving the relationship between orphaning and young adult outcomes.

I specifically study the subgroup of (Black) Africans, for which orphanhood is a common phenomenon. I find that although preexisting parental background characteristics and literacy and numeracy skills in the baseline survey are comparable between orphans and non-orphans, the latter are less likely to be employed (true primarily for males) or to have children (females) early in their lives. There is, however, evidence of some nuances existing in different subgroups of orphans, depending on the timing of parental death (at which age the person was orphaned), the type of orphanhood (parental vs. maternal vs. double orphanhood) and the involvement of caretakers (proxied by indicators of time and material investments). All these results suggest that orphanhood may not only alter educational achievements, but that it may also leave a long-lasting "imprint" in terms of employment and fertility patterns of those affected by parental death.

Before proceeding with the analysis of the data, I briefly summarize the state of the literature on the consequences of orphanhood. Based on this review, I offer some working hypotheses linking orphanhood and outcomes in young adults, which is done in section 2. In section 3, I introduce the data and present the main patterns describing the transition to adulthood in orphaned and non-orphaned young adults. In section 4, I formally test different hypotheses and offer an interpretation of the results. Section 5 concludes this paper.

2. Literature review and testable hypotheses

2.1 Literature review

It is hard to imagine a more traumatizing event than the loss of a parent during childhood. Not surprisingly, different disciplines have studied the consequences of orphaning. A well-documented finding in the specialized literature places orphans at a higher risk of poor educational outcomes than non-orphans. Cross-country evidence (Case et al. 2004, Guarcello, Lyon, Rosati, and Valdivia, 2004) suggests that orphans are, on average, less likely to attend school than non-orphans are. This disadvantage tends to be accentuated among those orphans living with distant relatives. More recently, Ainsworth and Filmer (2006) find that these differences in schooling may greatly vary from country to country. However, if the sample is restricted to the subgroup of countries in Eastern and Southern Africa, the strong link between orphanhood and decreased enrollment is restored.

Longitudinal studies have also confirmed this relationship and have established a causal link between orphanhood and educational outcomes. Case and Ardington

(2006) use a large longitudinal survey from northern KwaZulu-Natal. Both the large sample sizes and the longitudinal aspect of their dataset allow them to identify the causal role of orphanhood on educational outcomes, and to study the mechanisms that drive this phenomenon. Maternal death is found to have a negative causal impact, both in terms of years of completed education and in terms of enrollment, whereas paternal death does not have a causal effect on these indicators. Most of these results have been corroborated in other studies (Ainsworth, M., Beegle, K., and Koda, 2005, Beegle, de Weerdt, and Dercon, 2006, Evans and Miguel, 2007). Of particular interest to my study is the concern that poorer educational outcomes may, in turn, adversely affect key indicators later in adulthood, for example through the causal effect of education on earnings and income generation.

Another longitudinal strand of evidence studying the potential long term effects of orphanhood points in a similar direction. A study by Beegle, de Weedt and Dercon (2006) uses data from two waves of a Tanzanian panel (1991-94 and 2004) to establish the case for a causal link between maternal death and adult height, the latter being a long-term indicator of nutritional deprivation during childhood. Such differences in stature in adulthood may affect earning possibilities (Hadad and Bouis, 1991, Steckel, 1995, Strauss and Thomas, 1998), consequently constraining the prospects that these orphans will have as adults.

Psychologists have also studied the immediate and long-run implications of parental loss during childhood (Kranzler, 1990, McLeod, 1991, Sengendo and Nambi 1997, Cluver and Gardner, 2006). Evidence of psychological trauma due to parental death is relevant because it constitutes another pathway potentially affecting my

outcomes of interest, such as employment possibilities of adults (Ettner, Frank and Kessler, 1997). In this respect, the evidence suggests that parental death may indeed have persistent negative psychological effects, increasing the risk of adult depression and anxiety disorders.

Orphanhood also alters family composition, both mechanically and through the allocation of the orphan to new caretakers. Non-biological parents or guardians taking care of orphans may "invest" less time and material resources in them for a variety of reasons (Case, Lin and McLanahan, 2000). This may affect outcomes during childhood, such as school enrollment, but it may also alter the prospects that these children will have later in life. Gertler, Martinez, Levine and Bertozzi (2004) cast the debate in terms of whether parental *presence* or parental *presents* matter for human capital accumulation. On the one hand, they argue that lack of *presence* linked to parental loss exposes the child to "emotional distress and deprive[s] the orphaned child of love, nurturing, values, information and discipline." On the other hand, it is also possible that material deprivation resulting from parental death (lack of *presents*) could have detrimental effects on outcomes. Although their evidence comes from countries where orphaning is not a widespread phenomenon (Indonesia and Mexico), the authors find that the effect of orphanhood on human capital accumulation (health and education outcomes) cannot be solely explained by differences in their proxies of *presents* (household consumption per equivalent adult). This suggests a role for behavioral factors related to parental *presence*.

It is also worth mentioning that the literature studying the links between orphanhood and outcomes later in life shares some similarities with the broad,

extensive research literature on mechanisms linking outcomes in young adults and their circumstances earlier in life (Haveman and Wolfe, 1995). In both strands of the literature, outcomes are proxies for "success" in terms of achievements, such as schooling attainment, occupation and earnings, and behavioral outcomes (e.g., avoiding teen motherhood). However, the broader literature on achievements and child circumstances often focuses on rich countries, where large and detailed longitudinal datasets allow disentangling alternative potential pathways leading to subsequent poor outcomes in adulthood. This line of research usually draws on indicators of parental background, parental investments in children, and neighborhood characteristics. Although indicators of household composition, such as presence of (one or both) parents, are also used as controls, this strand of research does not specifically focus on the long term impact of orphanhood.

In developing countries, the scarcity of longitudinal data makes the study of long term consequences of childhood conditions a difficult task. However, research aimed at understanding how circumstances early in life affect choices and ultimately the scope for attaining key achievements in early adulthood is particularly needed in low-income countries. This is true not only because deprivation (e.g. income poverty) particularly affects children in developing countries (UNICEF 2005), but also because of other phenomena which may affect adult prospects, such as orphanhood (UNAIDS/UNICEF/USAID 2004). A study grounded on a rich, longitudinal dataset, such as the one I use in this paper, may help to pave the way for a more systematic approach in understanding the links between orphanhood and outcomes in young adults.

This non-exhaustive review of the literature suggests that there are many pathways that could act as a nexus between parental death during childhood and outcomes during early adulthood. In the empirical work that follows, I contrast these different hypotheses.

2.2 Hypotheses: Why might parental death affect outcomes in young adults?

In this section, I take stock of the previous literature and advance several hypotheses that I will test on the CAPS dataset. The richness of the questionnaire and the ability to track young adults over time allows me to pose different conjectures linking circumstances associated with orphanhood and outcomes later in life. One hypothesis that I consider is that such correlation is spurious. This could happen if there are factors driving both parental death and young adult outcomes, such as preexisting differences in parental background. To control for this concern, I will use baseline and retrospective information to control for observable differences in parental background characteristics, such as parents' employment, education and whether parents were ever married to each other.

The second hypothesis that I consider is that even when controlling for differences parental background, individual-specific factors may still account for differences observed between orphans and non-orphans. Children whose father or mother dies may have found it difficult to achieve desirable milestones in young adulthood, regardless of the case. While it is difficult to refute such fact, I use longitudinal information to suggest that this does not seem to be the case for young adults in CAPS. As I will show later, the evidence available suggests that there were no

discernible preexisting differences between those children whose mothers would ultimately die and those children whose mothers did not die.

The third hypothesis that I analyze in the next sections is that time and material investments may also explain subsequent outcomes in young adults. Orphans may receive less attention, guidance and material resources from caretakers, and this may explain part of the association between parental death and outcomes observed in young adults. This could occur if time and material investments have a role in predicting young adult outcomes (as summarized in Haveman and Wolfe 1995, in the context of studies carried on US datasets) and if orphanhood status is correlated with such investments. In order to explore this third hypothesis, I use a set of indicators of time and material investments on the young adults collected in the first (baseline) wave of the survey.

These three hypotheses need, however, to be placed in the context of the Cape Area Panel Study. Consequently, in the next section, I will summarize the main details of CAPS and describe how parental death correlates with household and individual characteristics. I will also make use of retrospective information to establish the extent to which the group of orphans differs from the group of non-orphans in their transition to adulthood. In order to do so, I will focus on outcomes of interest, such as schooling, employment and fertility. Finally, I will study the three hypotheses mentioned before in order to evaluate if the correlation between orphanhood and outcomes of interest can alternatively be explained in terms of differences in background, individual characteristics, and time or material investments.

3. Data and descriptive statistics

3.1 The Cape Area Panel Study (CAPS)

The Cape Area Panel Study is a longitudinal study of youth and their families. It focuses mainly on a Cape Town cohort of adolescents (ages 14 to 22 years at the time of the first interview), a critical period marked by the transition between school and early labor market attachment. My analysis relies on Waves 1 (collected in 2002) and 3 (collected in 2005). Cape Town is a large city of slightly less than 3 million inhabitants (South African Census 2001), whose population ethnically more diverse than the rest of South Africa. According to the last census figures from 2001, 32% of Cape Town residents are classified as African (Black), 48% are Coloureds (a group of mixed descent), and 19% are Whites. Also, the province of Western Cape, where Cape Town is located, is the second most prosperous province in South Africa in terms of income per capita. Despite these differences in racial composition and average incomes, the city shares a common feature with the rest of the country: sharp contrasts between different population groups. For example, the average Cape Town household inhabited by Whites reports earnings 8 times as high as those of African households. These disparities in living standards are linked to the different treatment that each of these population groups experienced under the segregationist Apartheid regime. Under this system, Africans were particularly constrained in terms of migration, employment and education prospects and aspirations. Some of the current residential and schooling patterns of young adults in CAPS still reflect these differences (Lam and Seekings, 2005).

These contrasts are also reflected in the labor market. Unemployment rates for Whites in Cape Town have been fluctuating around 5% for the last decade. Coloureds are much in line with the city average, which oscillates around 20%, and Africans experience unemployment rates that are close to 50%. Although these estimates depend on how unemployment is defined (Kingdon and Knight, 2004), the contrasts in job prospects between these racial groups remain significantly different, regardless of the methodology employed.

Cape Town has not been immune to the upward trend in orphaning rates that has been observed in the Black population of South Africa. In the baseline survey for CAPS, orphaning rates for young adults ages 14 to 22 were 32%, 17% and 6% for African, Coloured and the remaining population groups (mainly Whites), respectively. In this study, I focus on the Black population group, which is by far the hardest hit in both the prevalence of orphaning and the negative consequences of the former Apartheid regime.

3.2 Orphanhood: Household arrangements and timing of parental death.

Table 1 reports the number of African young adults in Wave 1 whose mothers and fathers were resident members of the household in which the adolescent is resident, were residents somewhere else, are dead, and those with an unknown status. Only 29% of Black young adults (427 cases out of 1469 observations considered) count both parents as residents in their household, whereas 70% of them are residing with at least one parent. This is a common phenomenon for Black young adults across South Africa, and this is possible for reasons other than parental loss, such as labor migration.

Regarding orphanhood status, in Wave 1, 21% of these African young adults had lost their fathers, and 7% had lost their mothers.

As was found in other settings in South Africa (Case and Ardington, 2006), paternal death is associated with different living arrangements than maternal death is, as the same table shows. About 60% of those whose fathers had died by Wave 1 were residents with their mothers. In contrast, only 22% whose mothers had died were still living with their fathers. Throughout this paper, I will test whether these and other differences in the circumstances of orphanhood matter when explaining young adult outcomes.

Table 2 displays information about the timing of orphanhood for young Africans, now using all information available up to Wave 3, including that coming from the retrospective life calendar. The table combines information about the living status of the biological father and mother of each young adult. About 59% of the 1469 young adults considered in this table are not orphans; that is, both of their parents are alive. Orphanhood status cannot be determined for about 3% of the sample: in the majority of these cases, this is due to a lack of knowledge of whether the young adult's father is alive or not. There are 567 young African adults classified as orphans. I am able to establish the timing of orphanhood (that is, the age of the young adult when he or she became an orphan) for only 285 of these young adults, as shown in the same table. Unknown timing of orphanhood is chiefly due to the many paternal orphans who do not know when their father died.

Of the 285 young adults for which the timing of orphanhood is known, 116 became orphans when they were between the ages of 13 and 17, suggesting that

parental death is more likely to occur during adolescence than in childhood. This phenomenon could reflect population trends (orphaning rates have steadily increased during the last 15 years in South Africa), but it may also be the consequence that recent deaths are more likely to be assigned a precise timing. In my analysis, I investigate whether the timing of death explains differences in outcomes. However, to minimize potential selection bias, I include all young adults in the analysis, regardless of whether orphanhood timing has been established or not, and I include, as a control, indicator variables for unknown orphanhood status. One should be careful, however, of potential sample selection problems, particularly in those orphaned at an earlier age. Even if attrition is low for Africans up to age 20 in CAPS, the young adult sample in the study only follows individuals who were ages 14 to 22 at Wave 1. Thus, no information is available for children who were orphaned during infancy and who moved to, or were assigned to, households outside the Cape Town area long before they reached age 14. I do not know of any study in the Cape Town area that could provide information to refute or avail this hypothesis, and so the results of regressions assessing the relationship between timing of orphanhood and adult outcomes should be interpreted with caution.

3.3. Retrospective life histories

Before proceeding with the rest of the descriptive statistics, it is worth devoting some time to describing the information contained in retrospective life history calendars. This allows me to construct a panel collecting outcomes of interest (schooling, residential

patterns, employment) for each individual over time (age) up to the present (Wave 3). The main interest in doing so is to display the temporal trajectories of orphans and non-orphans in terms of these outcomes, allowing the visualization of any pattern of divergence. Because I cannot trace the precise timing of orphanhood for all cases, I divide the sample of individuals into those who were orphaned at Wave1 and those who were not. I follow this classification in this section, mainly to divide the sample into only two groups when presenting the following figures. In this way I also avoid defining "orphans" as those who experienced parental loss late in young adulthood, because doing so could affect the interpretation of group estimates. In section 4, I relax this classification and evaluate the robustness of the results when considering different definitions of orphanhood status.

To give an example of how these trajectories are computed, let me introduce Figure 1. Using panel data constructed from the life calendar, I compute average school enrollment rates for groups of orphans and non-orphans of a given age. Each age displayed is not a birth-cohort, but an age-cohort comprised of all actual and retrospective observations of schooling outcomes reported for that particular age. Orphanhood classification is defined as of Wave 1, and a few cases for which orphanhood status could not be established (Table 1) are not included in the computation. Figure 1 displays age patterns in these group averages of enrollment rates for orphans and non-orphans (Lam et al, 2006, studied schooling outcomes of all population groups in CAPS using a similar procedure). Enrollment rates rapidly rise after age 5 and decline after age 15. Differences in enrollment between orphans and non-orphans are small, given the scaling of the graph, although orphans are less likely

to be enrolled in school for most age groups (for a thorough analysis of educational outcomes and orphanhood in CAPS, see Ardington, 2008, Chapter 5) .

How is orphanhood status linked to employment outcomes? CAPS retrospective life history calendars contain information on whether the individual was employed at a particular age, although it is not possible to establish whether the person was employed continuously or intermittently during each period (age) that is considered. With these caveats in mind, Figure 2 shows that employment rates among the group of orphaned males are higher than those of non-orphans. A simple hypothesis for explaining this result is that orphans have fewer resources channeled towards them, including support for schooling expenditures, and that this could prompt them into job search and eventually employment ahead of non-orphans. I will explore this hypothesis later, after investigating whether orphans in CAPS are at a disadvantage in terms of time and material investments.

Figure 2 suggests that higher employment rates among male orphans comes at the expense of lower enrollment rates, with a less clear pattern discernible among women. Interestingly, as Figure 3 shows, male orphans are more likely to report combining schooling and employment at a given age although the fraction of individuals reporting this behavior is small. This pattern of behavior does not imply that work and school overlap, since it is possible that some young adults work only during the school recess period. Also, it should be kept in mind that the reported school attendance may not automatically result in grade progression.

Figure 4 is in line with this last clarification. In contrast with the slight differences in enrollment rates mentioned in previous paragraphs, the gap between

orphans and non-orphans in completed years of schooling widens gradually, but steadily, with age. In Figure 5, the differential patterns in the transition from schooling into work are clear only for male orphans: the "orphan gap" in schooling rates widens progressively as orphans become more likely to be working. These "flow" indicators also match with "stock" variables, such as years of completed education and job experience, as Figure 6 indicates. Focusing on the sub sample of men, it is also clear that the fewer years of completed education in orphans do not necessarily result in more years of work experience, as Figure 6 also shows. The tight situation of the labor market for young Africans suggests that the transition between school and employment is characterized by a long period of job search. Thus, leaving school early does not necessarily put orphans at an advantage in terms of early job experience.

To conclude this subsection, I present information related to fertility. Figure 7 shows that orphaned females are more likely to report having a child than non-orphaned controls in their age group. Without more information, it is not possible to establish the implications that can be derived from these episodes of early childbearing. While I explore this issue in more depth later, it is worth noticing that this finding resonates with research citing orphanhood as a predictor of engagement in high-risk sexual behavior among South African adolescents (Thurman, Rown, Richert, Maharaj and Magnani, 2006).

3.4 Descriptive Statistics

Table 3 presents descriptive statistics for the sample of African young adults. I analyze outcomes as of Wave 3, when these individuals were aged between 17 and 25 years

old. However, in this table, as in most of the paper, I classify individuals according to their orphaning status at Wave 1, when they were ages 14 to 22. Since orphans are slightly older than non-orphans, I provide age-adjusted as well as unadjusted figures for all the characteristics under consideration. For example, 33.9% of orphans were in school in Wave 3, a lower percentage than that of non-orphans (42.4%). However, after controlling for age indicators, the difference of 8.5% points is reduced to only 2% points (as shown in the third column in Table 2.2), and the difference is no longer statistically significant.

In South Africa, education leaves a strong imprint in adult labor market outcomes. There are strong nonlinearities in the returns to schooling (Anderson, Case and Lam, 2001): passing the matriculation exam (called Matric, and administered at the end of the last year in high school) drastically improves the chances of employment and higher earnings. In the third Wave of CAPS, only 29% of African young adults had already completed at least 12 years of education, despite the fact that most of them are ages 18 or older. Orphans had a lower chance of having achieved this educational milestone, although the difference was not statistically significant, perhaps because of the small sample size.

Interestingly, literacy and numeracy tests applied to individuals in Wave 1 show no discernible differences between orphans and non-orphans. These tests may capture differences in abilities and motivation (albeit imperfectly), but they may also be considered as a measure of cumulative learning (Lam and Seekings, 2005, Lam, Leibbrandt and Mlatsheni, 2008). Additional results (not shown), also indicate that test scores at Wave 1 are not correlated with change in orphanhood status between Waves 1

and 3, so that those who became orphans between those survey waves were not lagging behind, a result that is in accord with previous studies (Case and Ardington, 2006, and to a certain extent, Evans and Miguel, 2007)

CAPS also includes information about parental background characteristics. In Table 3, I provide a small subset of such indicators. Orphanhood status does not seem to be related to parental education level, although information about the latter is not available for all parents (particularly fathers) and so, further evaluations may be required. There are also no discernible differences in the marriage status of their biological parents: about 30% of the parents of Black young adults in CAPS were never married, irrespective of orphaning status.

In terms of the characteristics of the households in which orphans reside, there are no substantial differences with respect to the households inhabited by non-orphans. Household size is smaller, although this could be a mechanical result from parental loss. With all other indicators considered, which describe the socioeconomic status of the household in which the young adult was a member of in Wave 1, no differences were found.

Childbirth outcomes are in line with the trends highlighted in the previous subsection: at least 1 in 3 orphans reported having had a child, compared to 1 in 4 non-orphans, a difference driven largely by the fact that orphans are older on average. Besides this, orphans are more likely to be the head of household, which is an abnormal occurrence for this age group; however, this result could also be mechanically driven by the death of a parent. In terms of employment, orphans are more likely to be working. It is important though to observe whether these differences are shared across

all age groups, and whether this finding is related to wage levels, an aspect I explore in a later section.

Not working is not necessarily an indicator of inactivity. First, an important group of young adults in CAPS stay in school (Lam and Seekings 2005), although such prolongation of schooling may not ultimately result in grade advancing. Second, the person may neither be in school nor working, but looking for employment or involved in housework. To differentiate between these outcomes, I define an individual as inactive when the person is not working, not in school, not looking for jobs, and not substantially involved in housework (25 hours/week being the cut-off for this last definition). The resulting inactivity rates are lower in orphans, although differences are not significant. Differences between orphans and non-orphans do not seem to emerge when evaluating alternative definitions of inactivity.

Although orphans are more likely to be working, it is not clear that they work for more hours, at least not when considering employment hours for all current occupations the person reports in Wave 3, as displayed in Table 3. Next, I consider all current occupations (as of Wave 3) and their characteristics in terms of payment and hours worked to derive an indicator of earnings per hours worked. I find that, on average, orphans' earnings per hour are 9% lower than those of non-orphans, this difference is, however, not statistically significant. Figure 8 displays a nonparametric estimation of log-wage densities for orphans and non-orphans, suggesting that the means may not be different, although there is a higher chance for orphans to earn relatively low wages.

In the next section, I analyze patterns describing the transition to adulthood in orphans focusing mainly on employment and fertility. I link these patterns to their schooling achievements to make sense of salient differences between orphans and non-orphans, which could reflect the already established differences in educational outcomes. I also explore whether orphans are homogenous as a group or not, exploring differences between different subgroups defined by the timing of parental death, the type of orphan (paternal vs. maternal vs. double orphan) and the age group to which they belong. Lastly, I evaluate whether differences in employment and fertility between orphans and non-orphans can be alternatively explained by differences in parental background and parental investment.

4. Orphanhood, fertility and employment in young adults

4.1 Orphanhood as a predictor of outcomes in young adults

In this subsection, I study different outcomes of interest at Wave 3 and their relation to different indicators of orphanhood status. This allows me to formally test for differences between orphans and non-orphans, but perhaps more importantly, to disaggregate results by age-gender cohorts to check whether some of these subgroups display prominent differences with respect to regression-matched groups of non-orphans.

Table 4 summarizes the result of probit regressions from which incremental effects (i.e., change in the probability of observing a positive outcome) of dependent variables were calculated. All regressions also control for age and gender indicators (these estimates are not reported in the table) as well as indicators for unknown status,

but they do not control for other covariates, such as parental background or indicators of time and material investments at Wave 1, which will be the focus of a later subsection.

Column 1 presents probit results in which an indicator for being employed in Wave 3 is regressed on a number of measures of orphanhood. The first panel shows that orphans (defined as having at least one parent dead at Wave 1) are more likely to be employed than non-orphans, after controlling for sex and age differences. This difference in employment rates, which amounts to five percentage points, is statistically significant.

Results displayed in the next panel of the same column indicate that not all categories of orphans are more likely than non-orphans to be employed. To make this comparison, I consider three mutually exclusive categories of orphans: paternal (only the father is known to be dead), maternal (only the mother is known to be dead), and double orphans (both parents are known to be dead). In this specification, the base category is not being an orphan, and each of the coefficients associated with the three categories (paternal, maternal, double) indicate the change in the probability of employment of orphans in that category with respect to the base category. As the table shows (second panel, first column), paternal orphans are more likely to be employed than non-orphans, whereas maternal orphans are not. Double orphans are less likely to be employed than non-orphans. Paternal orphans may be replacing their parents as breadwinners, whereas maternal orphans may be involved in household chores. As I will show later, double orphans are less likely to be in school than non-orphans, but

they are not more or less likely to be inactive than non-orphans. This suggests that they are more likely to be involved in a substantially larger amount of household chores.

Does the timing of orphanhood matter for employment? The third set of estimates in column 1 suggests that only those orphaned between the ages of 11 and 17 are more likely to be employed than non-orphans. Those orphaned earlier do not show significant differences with respect to non-orphans. There are two potential drivers of this result; one is a theoretical "scarring" effect. In the psychology literature, an earlier episode of parental death is considered more traumatic than a similar episode later in life (Kranzler, 1990). However, it is difficult to know what differences in scarring imply for employment outcomes in young adults. If scarring decreases school enrollment, and part of those orphans abandoning school look for and eventually obtain jobs, then more intense scarring would imply higher employment in young adults. However, scarring may also compromise skills needed to hold jobs and thus decrease the likelihood of being employed. The second potential explanation for why those experiencing bereavement at later ages are more likely to be employed is suggested by the timing of orphanhood itself. Orphans who experience bereavement at later ages may be under pressure to seek work to reestablish the household's resource base. In contrast, parental death during early stages may give more time for the surviving caretakers to adjust to the shock, long before the child reaches adolescence and becomes potentially employable. These findings are consistent with differences in school enrollment between these subgroups of orphans. This is likely because school enrollment might compete with work as an alternative time allocation in young adults. I will return to this later, when presenting results for schooling and enrollment outcomes.

Another way to evaluate whether the timing of death matters for the employment status of young adults is to include both orphanhood status at Wave 1 and at Wave 3 as indicators. The coefficient attached to orphanhood status in Wave 1 will isolate the effect of *already* being orphaned by that time. The coefficient attached to Wave 3 indicates whether those who *became* an orphan between Wave 1 and 3 are similar to those who were not orphans at Wave 3. The results displayed in the next panel of Table 4 indicate that those who experienced parental demise in between waves are more likely to be employed in Wave 3. This suggests that part of the adjustment to parental death in the short run is mediated by entering the job market.

So far, I have not allowed differences *within* the group of orphans to be explained by gender and age group indicators. However, it is possible for such differences to exist. The gap between orphans and non-orphans in different outcomes of interest may depend on gender, as Figures 2.1 to 2.7 seem to imply. Besides, it is possible that these differences are larger in specific age groups only to become less salient with age. For instance, this would be the case if the relatively early timing of childbearing in orphans is only the result of non-orphans postponing fertility. In order to check for such group differences, I consider four groups of orphans, defined by their sex and whether they were 17 years or younger at Wave 1. For each outcome of interest, I run separate regressions for females and males and present results in the last two panels of Table 4. In each of these regressions I use two interaction terms: the product of an orphan status indicator as of Wave 1 with each age group indicator (age<=17 or age>17 at Wave 1). This allows me to compare differences between orphans and non-orphans in two age groups: “younger” orphans, ages 17 or younger at

Wave 1, and "older" orphans, ages 18 or older. Throughout the remainder of the paper, the definition of "younger" and "older" orphans follows these definitions. To be clear about the econometric specification, let the outcome of interest in individual i be Y_i. Similarly, let the variable Age $<=17_i$ to indicate that the person was age 17 or younger at Wave 1, the variable Age $>17_i$ to indicate that the person was instead strictly older than age 17, and the variable O_i to indicate that the person was an orphan at Wave 1. The probit regression I consider is therefore of the form

$$\Pr ob(Y_i = 1) = F(a + b * O_i * Age <= 17_i + c * O_i * Age > 17_i + controls) \qquad (2.1)$$

with F being the standard normal cumulative density function, so that the difference in the occurrence of outcome i between orphans and non-orphans ages 17 or younger at Wave 1 depends on coefficient b, whereas the difference for older orphans depends on coefficient c.

For the case of employment as an outcome of interest, there is a substantial difference evidenced in the young male orphan cohort: employment rates are 15% points higher compared to non-orphaned males in the same age group. This indicates that differences in employment between orphans and non-orphans are driven by trends in the cohort of young males: higher employment rates are not observed in all groups of orphans.

Another outcome of interest is that of inactivity. Bozzoli (2006) finds that orphans are more likely to become inactive, with inactivity defined as being out of the labor market (not working or looking for a job), out of school and not spending significant time in housework. Although this result was obtained in a different setting (a less densely populated area in KwaZulu-Natal), it is interesting to evaluate whether

this result also applies to young Africans in Cape Town. In the CAPS sample, I find that inactivity rates are 2% points lower in orphans (second column of Table 4, first panel), but this difference is not statistically significant. Other specifications did not show remarkable differences, except a substantially lower rate of inactivity among those orphaned by age 10 (third panel, column 1) or among the group young male orphans (last panel in the same column). The fact that orphans in this last subgroup were significantly less likely to be inactive is in line with the finding that they are more likely to be employed than non-orphans of their same age.

Educational outcomes shed light on our previous findings on employment and inactivity. Because some individuals are as old as age 25 in Wave 3, I consider two outcomes to adequately capture orphan's disadvantages in terms of education: school enrollment and having completed at least Grade 12 by Wave 3. I study differences in enrollment status between orphans and non-orphans because school attendance may reduce the chances that the individual works concurrently. Thus, differences in enrollment rates may be linked with differences in employment outcomes, if only because schooling and work may compete in terms of time allocation. High-school completion may also be informative about the young adult's prospects in the labor market, particularly because of strong nonlinearities in the returns to schooling. However, it is highly unlikely that an individual would complete Grade 12 by age 17, even with adequate grade progression. Thus, for regressions explaining this outcome, I restrict the sample to young adults ages 19 or older at Wave 3.

Column 3 (in Table 4) reports differences in high school graduation (Grade 12 completed). Orphans are less likely to have completed Grade 12 by Wave 3 than non-

orphans, although this difference is small, relative to the respective coefficient standard error. Maternal orphans in this sample are less likely to have achieved this educational milestone. The timing of orphanhood also seems to matter. First, only those who became orphans between the ages of 11 and 17 were less likely to complete high school than non-orphans (panel 3), while those orphaned at earlier ages are more likely to have completed high school. Second, unlike those who were already orphaned by Wave 1, those who became orphans between waves 1 and 3 were less likely to have completed high school than non-orphans (panel 4). These findings suggest that parental demise during young adulthood has a disruptive effect in terms of education (Bozzoli, 2006, Ardington, 2008). These results match well with my findings on employment outcomes: age-matched orphans who lost their parents when they were between the ages of 11 and 17 are both more likely to be employed and less likely to have completed high school that those orphaned earlier.

Results in column 4 indicate that as of Wave 3, enrollment rates did not differ between orphans and non-orphans. However, those who became orphans between the ages of 11 and 17 were less likely to complete high school than non-orphans, a result that is similar to that found in those who became orphans between waves. Notice that in these two last groups employment rates are higher than those found in non-orphans, suggesting that employment patterns are linked with school enrollment status, at least in these subgroups of orphans.

How does orphanhood status correlate with fertility outcomes in young adults? An overview of results displayed in column 5 (Table 4) indicates that some groups of orphans are more likely to have become a parent. To place this result in context, one

should bear in mind that early childbearing occurs frequently among Africans in Cape Town. From the trajectories shown in Figure 7, we have seen that female orphans of all ages are more likely to have a child than non-orphan females of the same age. However, results displayed in column 5 (Table 4) indicate that this difference is large and significant only for orphaned females who were ages 17 or younger at Wave 1. These results are of particular concern when considering the documented links between early childbearing and adverse outcomes later in life (Fletcher and Wolfe, 2008).

The transition into adulthood is a difficult process for young Blacks in South Africa, who are not likely to become employed during this period, even if they actively search for jobs. This makes comparison of earnings difficult to interpret. One potential problem for inference is that the sample of working orphans may be different than that of working non-orphans, at least in preexisting household and individual characteristics. However, I did not find differences between orphan and non-orphan workers in terms of observables, such as indicators of household SES (assets and household per capita income in Wave 1) or individual characteristics (literacy and numeracy test scores or years of completed education, both measured in Wave 1). This does not preclude the existence of systematic differences in unobservable characteristics, although tests conducted using the rich array of variables available in CAPS suggest that such a possibility is likely to be limited. Figure 8 presents a nonparametric density estimation of wages per hour for orphans and non-orphans. The empirical density of orphans' wages seems to be more spread-out than that of non-orphans, but with orphans being more likely to earn relatively low wages than non-orphans.

Given that low wages are of particular concern, I inspect this issue more carefully. I consider 3 rands per hour ($0.78/hour in purchasing power parity adjusted dollars of 2005, according to IMF, 2008) as an upper cut-off for characterizing low wages in this sample. Column 6 presents different specifications to explain the likelihood of earning less than 3 rand/hour for all individuals that report currently working in Wave 3. Estimates show that orphans are more likely to be earning low wages (first panel, column 6). The difference is significant across different subgroups of orphans, but does not hold for all specifications. Although estimates by subgroups defined by age-gender are not statistically significant, there is a tendency for young orphans (those under age 17 at Wave 1) to be at substantial risk for earning lower wages compared to non-orphans from the same age group. This may be the result of different factors, such as poorer educational achievements, or (perhaps) lower reservation wages in orphans. Later, I will analyze wage determinants in greater detail to offer a more complete explanation.

In sum, both male and female orphans experience different patterns of transition to adulthood than do non-orphans in the comparison group. In what follows, I devote attention to two main results emerging from this subsection. I focus on employment and wages among men (since early entry in the labor market seems to be particularly prominent for male orphans) and on early childbearing events among female orphans, where I try to identify potential driving forces behind this phenomenon.

4.2 Potential mediating factors: parental background and investments

The main hypothesis of this paper is that orphan status predicts different patterns of transition to adulthood, this transition being measured in terms of key outcomes describing fertility choice and labor market attachment in early adults. While this hypothesis was confirmed at large in the previous subsection, it remains to be explained which channels may mediate between orphanhood status and differences in outcomes. The rich set of variables contained in CAPS allows me to investigate different hypotheses in this respect.

One hypothesis is that the parental characteristics of orphaned young adults are different from those of non-orphaned ones, and that parental background affects outcomes. Under this hypothesis, neglecting differences in parental background in the testing specification results in an omitted variable bias. To explore this possibility, I use different proxies for parental background: educational levels of the parents, if this is known; parental employment characteristics, either current or when the parent(s) were alive; and an indicator for whether the parents were ever married to each other. I also control for the place of birth of the young adult, using an indicator that the person was born in the Cape Town area. Table 5 presents proxies describing the educational background and employment status of fathers and mothers of young adults, tabulated by orphaning status at Wave 1. A quick inspection of this table indicates that there are virtually no differences in terms of parental background. Mothers of orphans are slightly more likely to have no school experience than those of non-orphans, but they are also more likely to have a post-Matric education (in this last case the difference is not significant). Fathers of orphans are significantly less likely to participate in some occupational types (crafts and plant/machine operatives). Nevertheless, there are no

clear trends signaling differences in general socioeconomic status between orphans and non-orphans. Still, one may want to use these indicators to absorb potential unobserved (individual or family) heterogeneity correlated with parental background.

Another hypothesis is that time and material investments usually made by biological parents could have an important role in shaping the timing of key outcomes in young adults. Although orphans often live with an extended family, this does not necessarily imply that their new caretakers can provide as much time or attention or material resources as biological parents may have provided. To investigate this hypothesis, I make use of a set of indicators collected during the first round of CAPS, which are proxies for time and material investments that parents, step parents or guardians allocate to young adults. The survey captures different types of time investments by asking each young adult in the survey how often they participate in certain activities with each potential caretaker. The activities that proxy for time investments in CAPS are defined in the questionnaire as “spending the night with the young adult”, “spending time”, “discussing personal matters”, and “eating meals together”. The frequency with which each of these activities is carried out by the young adult and a given caregiver is assigned a number in a scale from 1 (never did such activity in the previous 12 months) to 7 (the activity was carried out daily). This assessment is made by the young adult, separately considering each potential caregiver: father, mother, step-parent or guardian. Thus, for each activity, more than one answer is possible, since there may be more than one caregiver carrying out that activity with the young adult (e.g., both the father and the mother of the respondent may spend time discussing personal matters). In order to have only one indicator for each possible

activity, I choose the largest score (in the possible scale of 1 to 7) assigned for such activity among all listed caregivers. For example, if both the mother and father are caregivers, and if the young adult "discusses personal matters" with the mother on a daily basis (i.e., a score of 7 in this case), but never did so with the father (i.e., 1 point in this case), the tally assigned for time investment in "discussing personal matters" is 7. These indicators of specific time investments signal how fluid the relationship is between a young adult and his or her caregivers. I have also disaggregated the caregivers into three different categories: mothers, fathers and "others." This is an exercise of interest since, for example, the time devoted by the father may condition outcomes in a different way than the time devoted by the mother. However, allowing for this distinction of three categories of caregivers did not qualitatively change the regression results that I display below (Tables 2.7 to 2.10), and thus I only display parsimonious specifications for which time investment is considered a single variable.

Material investments in the young adult are probed by asking whether any of the potential caregivers has financially supported the young adult during the previous year, with support defined as providing resources for "school", "clothing", "gifts" or "pocket money". Since each question is asked with respect to different potential caregivers, I proceed analogously as before: if any of these individuals financially supported the young adult in a given item (for example school), I consider that such type of material investment was provided, assigning a 1 for that type of investment, and 0 otherwise.

Table 6 presents the relationship between time and material investments at Wave 1 and parental death. Columns 1 to 4 focus on proxies of time investments,

modeled as an ordered probit with possible outcomes ranging from 1 to 7. As explanatory variables, I include indicators of living status of biological parents (father dead, mother dead) at Wave 1, and additional controls for gender and age of the young adult (these coefficients are not reported). All estimates across 4 columns are negative, indicating that parental death is correlated with decreased time investments in young adults, although only one coefficient is significant at standard statistical levels. That is the case of time devoted to the discussion of personal matters (column 3), for which maternal orphans are less likely to benefit from the reference person in the household (father, step father/mother or guardian).

Columns 5 to 8 report coefficients from probit regressions for which the outcome of interest is receiving a particular type of financial support (material investment): school, expenditures, clothes, gifts or pocket money. Explanatory variables in each regression are those mentioned for columns 1 to 4. No information exists to help determine the amount of these expenditures, that is, I am only able to observe whether the young adult received financial support for particular items from a household member (mother, father, step-parent or guardian). Estimates reported in columns 5 to 8 indicate that parental death seems to be associated with material deprivation: orphans are at a higher risk of lacking resources for education, clothing, gifts and pocket money.

The availability of indicators of parental background and investments allows me to do further inquiries on the nature of the relationship between orphanhood and attachment outcomes in young adults. These indicators help to test whether orphanhood is directly related to outcomes of interest (such as employment or fertility outcomes) or

whether part of this relation is explained (mediated) by other circumstances associated with orphanhood, such as parental background or "parental" (time and material) investments. Controlling for a broader set of parental background characteristics may also indicate if differences between orphans and non-orphans are a mere reflection of preexisting differences in parental background. I do not expect that to happen, though, since in my sample, orphans and non-orphans appear to be similar in terms of most of these characteristics. Time and material investments in young adults could, on the other hand, explain differences in outcomes since, as shown before, orphans are less likely to benefit from some of these forms of support.

4.3 Employment and wages in males: testing potential mediating factors

In this subsection, I concentrate on employment outcomes in males. I use the results from the last panel of Table 4, which models employment outcomes in males, as a starting point. Next, I separately add controls for parental background and investments to check for mediating factors. If these factors are a competing explanation for predicting differences in employment between orphans and non-orphans, one would expect the coefficients of orphanhood indicators to change substantially. If this is not the case, it could still be possible for these factors to serve as additional explanatory variables, but their role as predictors in the relationship between orphanhood and employment outcomes would be ruled out. One should, however, be careful about the existence of confounding variables determining both labor market outcomes and parental investments in orphans, for example, differences in innate abilities, so that results should be interpreted cautiously.

Table 7 shows probit regressions for the subset of males, in which the dependent variable is an indicator of employment. Column 1 replicates the results from the last panel displayed in Table 4, indicating that only young orphans are more likely to work than non-orphans in that age group. This difference is not significant in the cohort of older orphans. In column 2, I add controls for indicators of parental and individual background: parents' education, employment, marriage status, and whether the young adult was born in Cape Town. Estimates attached to orphanhood indicators do not change substantially, nor are controls for background indicators statistically significant (as shown in the corresponding Wald Test). These findings rule out the possibility that parental background characteristics explain why young male orphans are more likely to be employed.

Next, I consider different indicators of time and material investments. To reduce dimensionality, I average the indicators of time investments, displayed in columns 1 to 4 in Table 6, and normalize them to a 0-1 scale. I follow the same procedure for material investments (columns 5 to 8 in Table 6). I use both these indexes as controls, together with an indicator for whether school fees are paid for, which is one of the components of the material investment index. This specification implicitly distinguishes material investments in two categories: educational investments and other financial support indicators, which are allowed to affect outcomes differently. Column 3 in Table 7 shows that employment in Wave 3 is negatively correlated with material investments.

However, this specification constrains the marginal impact of parental investments on outcomes to be the same for orphans and non-orphans, but this may not

be the case. In order to check for this, I run a more flexible specification. In order to be clear about this procedure, let me add some additional notation. Assume, for purposes of simplicity, that there is a single indicator of investments, I_i. I estimate equations of the form

$$\Pr(Y_i = 1) = F(a + b*O_i*Age<=17_i + c*O_i*Age>17_i + d*I_i + e*I_i*O_i) \qquad (2.2)$$

which may include additional controls. If e≠0 in (2.2), the difference in the probability of observing an event in two identical young adults, one being an orphan and the other not, now depends on both the value of I and the age group they to which belong. For example, for young adults ages 17 or under in Wave 1 receiving "complete" investments (I=1), the change in the probability of a given outcome associated with orphan status is:

$$\Pr(Y_i = 1 | O_i = 1, Age <= 17_i, I_i = 1) - \Pr(Y_i = 1 | O_i = 0, Age <= 17_i, I_i = 1) = \qquad (2.3)$$
$$F(a + b + d + e) - F(a + d)$$

Analogous calculations for different age groups and levels of investments allow us to evaluate which groups of orphans are more (less) likely to be employed than their respective regression-matched comparison group. Using estimates from the fourth column of Table 7, I consider the extreme cases of no material investment (I=Index=0) and complete investments (I=Index=1) separately. For the case of I=0, both age groups of orphans (young and old) are more likely to be employed than matched non-orphans. Employment rates in younger orphans are 20.8 percentage points higher (=-0.136+0.343) than those of otherwise identical non-orphans. This difference is smaller for the group of older orphans, 15.9 percentage points (=-0.184+0.343). On the other hand, a similar comparison, but this time holding Index=0, indicates that employment

rates are lower in older orphans (18.4 percentage points), with no differences found when considering the younger cohort. Other specifications including interactions with the remaining indicators of investment were tried, but proved not to be significant.

How can these results be interpreted? If one were to follow the hypothesis that orphans are particularly deprived in material terms, one would expect them to be more likely to be employed. This would be the case in a simple labor supply model without labor market frictions, in which less material investment is interpreted as a negative "wealth" effect. However, the results discussed in the previous paragraph indicate that those orphans who received material support are more (not less) likely to be employed. This striking result has different interpretations. First, lack of material support to pursue job search activities may reduce the chances of a successful job search in a very tight market. Second, it is also possible that the allocation of material investments could be more sensitive to differences in ability among orphans than in non-orphans. Unobservable differences in ability may in turn predict a successful, if somewhat early, transition to employment. This last reading of the results suggests that one should be careful about policy implications of this regression specification, because the type of data and indicators needed to test these conjectures exceed the scope of CAPS, and likely the scope of any other longitudinal survey conducted in a country with high rates of orphanhood.

Given that orphans are, on average, more likely to be employed: what can be said about their wage levels? Is higher employment the reflection of orphans having potentially lower reservation wages? This could be consistent with observing a higher proportion of working orphans receiving low wages. Table 8 presents estimates from

probit regressions with a similar arrangement of columns as the preceding table. The first column does not display a significant relationship between orphanhood and low wages, although estimates for both younger and older groups of orphans are positive. When controlling for parental background (column 2), an interesting pattern emerges: estimates for both cohorts of orphans rise. A sizable fraction of this change in the estimates is due to the inclusion of indicators of parental education status (described in Table 5). Results displayed in column 3 show that material investments significantly reduce the chances to be a low wage earner, although this specification does not substantially alter the estimates of orphanhood status indicators. Introducing an interaction between orphanhood status and the index of material investments does not change estimates either (column 4).

Next, I estimate expanded Mincer-type regressions to evaluate determinants of (log) wage earnings. Column 1 in Table 9 displays OLS estimates of earnings per hour, explained by orphanhood status indicators. Wages earned by younger orphans seem to be particularly low, although the coefficient is not statistically significant. Column 2 displays estimates controlled for parental background characteristics. This change makes wage differences between orphans and non-orphans statistically significant for the subgroup of young adults. Results in column 3, which instead include time and material investments as controls, suggest that the link between orphanhood status and wages is not robust, probably because there are too few observations of working young orphans. At best, it can be said that young orphans are more likely to earn low wages than controls. This wage "discount" might be the reflection of young orphans who are willing to work for substantially lower wages in a very tight labor market. Results (not

shown) using proxies for reservation wages in CAPS point in this direction, although these proxies are based on subjective considerations.

Finally, for comparison purposes, I also estimate a proxy for the returns to schooling. Column 4 includes the number of completed years of education at Wave 1 (instead as of Wave 3, to reduce concerns about endogeneity), finding large payoffs for each additional year of education (about 10%/year). The inclusion of educational outcomes in the regression does not change the differences in earnings explained by orphanhood status (as of Wave 1), nor is any significant change found when including the scores earned in the literacy and numeracy test in Wave 1.

In sum, male orphans are more likely to be employed than non-orphaned matched controls. This difference does not change when controlling for parental background characteristics. However, I find that material investments (resources provided in the form of school fees, clothing, and gifts) are significant predictors for these outcomes. Orphans receiving high levels of investments are more likely to be working than regression-matched controls, whereas older orphans (i.e., those who where ages 18 or older at Wave 1) receiving no support are significantly less likely to be working. This suggests that employment outcomes may not be satisfactorily explained in terms of material hardship, since some of the most deprived groups (older orphans with no material investments) are less likely to be working. A more complex mechanism seems to be at play.

4.4 Fertility in Women: testing potential mediating factors

In this subsection, I study fertility patterns in female orphans, testing whether parental background or time and material investments are mediators in the relationship between orphanhood circumstances and fertility outcomes.

As a reference, the first column in Table 10 displays probit model estimates (also exhibited above in Table 4, penultimate specification), showing a higher chance of early childbirth among female orphans. Column 2 displays results after the addition of parental background characteristics as controls has been made. Although parental background characteristics are predictors of early pregnancy (Wald test p=0.045), these controls do not significantly change the explanatory power of orphanhood status. A similar result is observed when controlling for time and material investments, except that investments in the form of schooling fees paid reduces the chances of childbirth reported in Wave 3. A more flexible specification, displayed in column 4, uses an interaction between an indicator that school fees are paid and an indicator of orphan status, both defined as of Wave 1. These last estimates indicate that young orphaned females (ages 17 or younger at Wave 1) are more likely to report having a child than regression matched non-orphans: a difference of 37 percentage points for those whose school fees were not paid for in Wave1, and of 14 points among those for whom fees were paid. The difference between both estimates is statistically significant. One may wonder if reverse causality, that is women becoming pregnant and consequently interrupting their schooling, may alternatively explain this result. This is not the case for orphan females in the younger cohort: in Wave 1, only 4% of them reported ever being pregnant, and the results do not significantly change when excluding this small subgroup.

In the group of older female orphans, resources spent in schooling at Wave 1 were also correlated with a drop in the chances of ever having a child: the difference is 11 percentage points. However, since this group is older, the possibility of reverse causation from fertility to loss in support for schooling is of potential concern.

5. Summary and conclusions

Although sub-Saharan African young adults have a high chance of losing one or both parents before reaching adulthood, little is known about the transition of these orphans to adulthood. Evidence from different field sites suggests that schooling is affected by parental death and that this effect is persistent (Case and Ardington, 2006, Ardington, 2008).

In this paper, I studied the implications of orphanhood on employment and early childbearing outcomes, following a cohort of young adults, some of them reaching age 25 at the last survey round. I presented two types of evidence. The first type of evidence focuses on outcomes, indicating that orphans have a different type of transition into adulthood. I find that, in Cape Town, African male orphans are more likely to become employed, and that paternal orphans, double orphans, and those orphans who are relatively young are more likely to be paid low wages. Orphaned women, on the other hand, are more likely to become teenage mothers than non-orphaned women.

The second type of evidence results from studying different potential mechanisms linking orphanhood circumstances and subsequent outcomes in young adults. For this purpose, I use baseline information about parental background and

investments in the child. I do not find evidence that orphans are at a disadvantage in terms of the socioeconomic status of their biological parents, but I find that material investments are negatively affected. I also find that these differences in material investment help to explain differences in later outcomes: economic support is a predictor of higher employment in orphaned men, and schooling support is negatively correlated with early childbearing in women. Although it is not clear that material resources cause these outcomes, this suggests an additional hypothesis to be tested in longitudinal studies collecting information about time and material investments.

Linking the first with the second type of evidence, it is suggestive that the orphan gap in outcomes is pronounced despite orphans and non-orphans having similar family backgrounds and observable individual characteristics. This holds, for instance, when orphans and non-orphans have statistically identical literacy and numeracy scores. However, I find that indicators of material investment in orphans (not necessarily in schooling) are low, and that this may in turn help explain such differences.

Because my findings are based on a cohort of young adults in Cape Town, they may not apply in other settings. There are few other longitudinal datasets that provide information both on conditions in childhood and adolescence (particularly in orphans) and on outcomes as these individuals become adults. Bozzoli (2006) found that on average, orphans in a relatively rural demographic surveillance area in KwaZulu-Natal are at a higher risk of becoming inactive (using a definition analogous to that used in this study). This result may not seem similar to the findings of this paper. This deserves some qualifications. First, orphans in the subsample of ages 18 to 21 in Bozzoli (2006)

are more likely to be employed, in line with the findings I documented in a similar age cohort in this paper. Second, difference-in-differences estimates in Bozzoli (2006) suggest that the impact of parental death on employment is positive on those with better preexisting educational endowments. In the CAPS sample, I find that employment is particularly higher among those orphans who had received more material support in the previous survey wave. These clarifications suggest that findings based on both the CAPS and KwaZulu-Natal samples are consistent with the hypothesis that investments, particularly in human capital formation, are protective against the negative effects stemming from parental death. This does not rule out the role that geographic differences in the workings of labor markets may have. Residents in KwaZulu-Natal may have to defray higher costs associated with the job search than residents in Cape Town, given the relative scarcity of jobs in less densely populated regions of KwaZulu-Natal. Orphans in less densely populated settings may face more difficulties in overcoming such job search barriers. This is a topic of further research, which may be based on national longitudinal studies, for example, using data coming from the recently launched first National Income Dynamics Study (NIDS) in South Africa.

Female orphans being at a higher risk of becoming teen-mothers is another finding of this article, and this is in accord with the findings of Thurman et al. (2006), which documented risky sexual behavior in orphans. Even if cumulative fertility rates (i.e., total births over the lifetime of a woman) are not affected by parental death, the timing of childbirth could have important implications. The life cycle consequences of early childbearing have been discussed extensively in the literature, which may constitute another channel that puts orphans at risk for poorer outcomes during

adulthood. It is also worth mentioning that lack of investments in school fees are a strong predictor of earlier childbirth outcomes, this result being robust to the potential concern about reverse causation (i.e., women interrupting schooling because of pregnancy).

As discussed before, there are different mechanisms that could be behind the link between orphanhood and outcomes in young adults. I have explored these mechanisms using CAPS data. First, I found that differences in parental background between orphans and non-orphans do not seem to be a relevant factor explaining differences between these two groups, at least not in the sample I study. Second, literacy and numeracy skills are similar in orphans and non-orphans, so that their subsequent poorer outcomes cannot be linked to preexisting difficulties in these types of skills. This result is in accord with studies suggesting that orphans were not lagging behind in school before parental death occurred (Case and Ardington, 2006). Third, when I study the allocation of time and material resources, I find that it seems to be adversely related with orphanhood. Lack of some of these resources helps to explain subsequent poorer outcomes in orphans. It is possible that unobservable characteristics driving both the allocation of resources and the occurrence of subsequent outcomes could explain this finding. Only longitudinal information may help answer this question. However, since both parental background information and test scores are similar between orphans and non-orphans, this concern is played down.

The quality and depth of the longitudinal information included in CAPS allowed me to conduct a study to explore fertility and labor market outcomes in orphans. The fact that employment and fertility outcomes are different among orphans,

even while controlling for different confounding factors suggests that the consequences of parental death go beyond differences in educational achievements. It is possible that the next waves of this survey will allow researchers to study additional topics of interest stemming from the outcomes I have studied in this paper. One of these topics is the potential intergenerational transmission of the disadvantages that the current generation of orphans is experiencing. Evidence supporting this last hypothesis would imply that long term growth and inequality indicators in sub-Saharan Africa could also be affected in the decades to come.

6. References

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Table 1: Parental Status of Young Adults, Ages 14—22 at Wave 1

	Father's Status				
Mother's Status	Alive, resident with young adult	Alive, not resident with young adult	Dead	Status Unknown	Row totals(percentage of mothers)
Alive, resident with young adult	427	305	186	26	944 (64.3)
Alive, not resident with young adult	64	258	85	7	418 (28.5)
Dead	23	44	33	4	104 (7.1)
Status Unknown	0	1	0	2	3 (0.2)
Column Totals (Percentage of fathers)	514 (35.0)	608 (41.4)	308 (21.0)	39 (2.7)	1469

Notes: Only cases with valid information for Waves 1 and 3. Orphanhood status at Wave 1 is checked against information on Wave 3 for consistency.

Table 2: Orphanhood status and timing of parental death, Wave 3

	Number of Cases
Total Observations	1469
of which:	
Both parents alive	862
Orphanhood Status Unknown	40
Orphan (at least one parent known to be dead)	567
of which:	
Age when became orphan is unknown:	282
Age of orphanhood established:	285
of which:	
Orphaned between the ages of 0	53
Orphaned between ages of 8 and	46
Orphaned between the ages of 13	116
Orphaned at later age (18-25)	70

Notes: The table uses information collected in Waves 1 and 3 as well as retrospective calendar year data. In most cases, the age of the individual at the time of parental death is explicitly reported in the questionnaire. If this was not reported, but the relevant parental death event (mother/father) is known, then the age at which the young adult last lived with his/her mother/father is considered as the age of death (although this replacement is done in few cases).

Table 3: Descriptive Statistics for CAPS African Young Adult Sample: Orphans vs. Non-Orphans, Wave 3.

	Person is not an orphan Wave 1 (1)	Person *is known* to be orphan Wave 1 (2)	Difference Col (2)-Col(1), age adjusted	N
Individual Characteristics				
Age, years	21.06	21.64***	N/A	1433
Indicator: Person in school	0.424	0.339***	-0.020	1433
Indicator: Passed Matric	0.293	0.281	-0.043	1358
Literacy and numeracy test score (Wave 1)	22.79	23.01	0.032	1413
Indicator: Has child	0.253	0.326***	0.040	1433
Indicator: Person is head of household	0.063	0.100*	0.024	1433
Parental Background				
Mother's Education (Yrs., if known)	8.20	7.96	-0.13	1256
Father´s Education (Yrs., if known)	7.23	7.32	0.13	855
Indicator: Parents ever married	0.702	0.685	-0.024	1420
Household Characteristics				
Per capita Household Income (Rand/mo)	685	705	-14	1376
Household Size	5.47	5.09*	-0.32	1425
Number of Assets	6.14	5.94	-0.18	1353
Highest ed. Level of other HH members, wave 1	10.66	10.56	-0.10	1404
Highest Age of Other HH members, wave 1	48.08	46.12*	-1.80	1412

Table 3 (cont.): Descriptive Statistics for CAPS Young Adult Sample: Orphans vs. Non-Orphans, Wave 3.

	Person is not an orphan Wave 1 (1)	Person *is known* to be orphan Wave 1 (2)	Difference Col (2)- Col(1), age adjusted	Number of Observations
Employment Indicators				
Indicator: Works Now	0.264	0.341***	0.042	1432
Indicator: Not working, not in school, not looking for jobs and less than 30hr./wk housework	0.079	0.056	-0.025	1432
Number of calendar years with work reported	0.82	1.08**	0.13	1433
Hours worked per month from all current jobs, (if working)	275.85	286.35	10.83	367
log hourly wage, if currently working (rands)	1.597	1.505	-0.144	306

Notes to Table 3: The sample includes all young adults with valid observations in Wave 3, whose orphanhood status at Wave1 is known. Asterisks in column 2 indicate that the differences between the results in these column and those in column 1 are significant at 10 percent (*), 5% (**), and 1% (***) levels. Averages displayed in columns 1 and 2 are not adjusted by age. The age adjusted *difference* between columns 1 and 2, displayed in column 3, is computed via an OLS regression of the variable on a dummy for orphanhood status and age indicators. All statistics are computed using sampling weights adjusted for sample design and non-response, and standard errors are computed allowing for intracluster correlation.

Table 4: Change in the probability of different outcomes explained by orphanhood status indicators.

Outcome at Wave 3	(1) Person is employed	(2) Person is Inactive	(3) Grade 12 completed	(4) Enrolled in School	(5) Person had a Child	(6) Low wage earner
[observed frequency]	[0.288]	[0.0732]	[0.347]	[0.401]	[0.277]	[0.191]
N=	1444	1445	1074	1469	1446	304
Indicator: Mother and/or father is dead, Wave 1	0.0499*	-0.0248	-0.0476	-0.026	0.0386	0.115**
	[0.0283]	[0.0151]	[0.0379]	[0.0358]	[0.0267]	[0.0481]
Indicator: Paternal orphan, Wave 1	0.0873**	-0.0262	-0.0402	-0.0159	0.0407	0.1087**
	[0.0357]	[0.0162]	[0.0412]	[0.0399]	[0.0313]	[0.0567]
Indicator: Maternal orphan, Wave 1	-0.0284	-0.0301	-0.133**	-0.0063	0.102	0.0938
	[0.0477]	[0.0261]	[0.0578]	[0.0832]	[0.0719]	[0.105]
Indicator: Double orphan , Wave 1	-0.139*	0.0101	-0.0519	-0.172	-0.0551	0.418**
	[0.0605]	[0.0451]	[0.105]	[0.224]	[0.0804]	[0.203]
Test: Paternal orphan=Maternal orphan=Double orphan=0, p-value	0.0171	0.427	0.181	0.798	0.146	0.0353
Test: Paternal orphan=Maternal orphan, p-value	0.069	0.0855	0.171	0.917	0.446	0.855
Indicator: Person was orphaned when aged between 11-17	0.0849*	0.0372	-0.110*	-0.0907*	0.0365	0.0823
	[0.0529]	[0.0321]	[0.0534]	[0.0500]	[0.0500]	[0.0848]
Indicator: Person was orphaned by age 10	-0.0450	-0.114***	0.221**	0.110	-0.0661	0.0195
	[0.0619]	[0.0293]	[0.106]	[0.0954]	[0.0577]	[0.112]
Test: Orphaned 11-17=Orphaned by age 10, p-value	0.232	0.014	0.020	0.098	0.300	0.713

Table 4 (cont.): Change in the probability of different outcomes explained by orphanhood status indicators.

Outcome at Wave 3	Person is employed	Person is Inactive	Grade 12 completed	Enrolled in School	Person had a Child	Low wage earner
[observed frequency]	[0.288]	[0.0732]	[0.293]	[0.401]	[0.277]	[0.191]
N=	1444	1445	1371	1469	1446	304
Indicator: Mother and/or father is dead, Wave 1	-0.0037	-0.0205	0.0483	0.0513	0.0424	0.126*
	[0.0395]	[0.0237]	[0.0513]	[0.0574]	[0.0470]	[0.0791]
Indicator: Mother and/or father is dead, Wave 3	0.0678*	-0.0064	-0.113**	-0.0905*	-0.0045	-0.0109
	[0.0381]	[0.0255]	[0.049]	[0.0492]	[0.0420]	[0.0724]
Orphan (Wave 1) * Age (Wave1)<=17, Female	-0.0138	-0.0244	-0.0183	-0.0451	0.172***	0.303
	[0.0765]	[0.0358]	[0.0872]	[0.0614]	[0.0622]	[0.281]
Orphan (Wave 1) * Age (Wave1)>17, Female	0.0723	-0.0084	-0.0813	-0.0667	-0.0205	0.0812
	[0.0485]	[0.0281]	[0.0547]	[0.0587]	[0.0515]	[0.0714]
Orphan (Wave 1) * Age (Wave1)<=17, Male	0.152*	-0.0617***	-0.0527	-0.0199	0.145	0.212
	[0.0864]	[0.0188]	[0.115]	[0.0736]	[0.108]	[0.186]
Orphan (Wave 1) * Age (Wave1)>17, Male	0.0285	-0.0316	-0.0129	0.0171	0.0094	0.104
	[0.0451]	[0.0227]	[0.0579]	[0.0642]	[0.0419]	[0.0771]

Notes to Table 4: Each panel reports incremental effects based on a probit specification and its robust standard error (between brackets), which allows for intracluster correlation. Regressions use sampling weights adjusting for sample design and non-response at the household and individual level. All regressions include age indicators (Wave 3) and indicators that parental living status (as defined in each panel) is unknown. Regressions in panels 1 to 4 also include an indicator that the person is female. In the last two panels, analogous interactions to those displayed are formed with an indicator that orphan status is unknown, and included in the specification. Asterisks indicate that the differences between the estimates are significant at the 10 percent (*), 5 percent (**), and 1 percent (***) level. For definitions of outcomes, see main section of the paper. All specifications include individuals with valid observations in Wave3, except for regressions in Column 3 (Grade 12 completed), which only includes those (strictly) older than age 18 at Wave 3.

Table 5: Parental background: orphans vs. non-orphans

Panel A: Mothers

	Mother alive, Wave 1 (1)	Mother known to be dead, Wave 1 (2)
Occupation of mother		
Manager/ Administrative	1.31%	1.10%
Professional	3.96%	4.65%
Associate professional/ Technical	1.50%	2.52%
Clerical/Secretarial	1.93%	3.57%
Craft and related	12.22%	11.13%
Personal/Protective Service Occupations	0	0.25%
Sales Occupations	2.66%	2.90%
Plant and Machine Operatives	0.49%	0.24%
Other occupations, elementary	45.3%	44.83%
Education of mother		
Unknown	7.97%	11.64%***
If known:		
-Never went to school	3.95%	7.13%*
-Grades 1-7	30.50%	30.88%
-Grades 8-11	53.45%	46.81%
-Grades 12 (Matric) and above	12.10%	15.18%

Panel B: Fathers

	Father alive, Wave 1 (1)	Father known to be dead, Wave 1 (2)
Occupation of father		
Manager/ Administrative	3.77%	3.97%
Professional	2.98%	1.99%
Associate professional/ Technical	1.75%	0.68%
Clerical/Secretarial	1.70%	1.69%
Craft and related	9.20%	5.52%**
Personal/Protective Service Occupations	3.15%	4.71%
Sales Occupations	2.66%	2.90%
Plant and Machine Operatives	15.09%	11.23%***
Other occupations, elementary	20.74%	17.52%
Education of father		
Unknown	32.62%	63.13%***
If known:		
-Never went to school	9.84%	8.27%
-Grades 1-7	38.13%	40.08%
-Grades 8-11	38.19%	37.54%
-Grades 12 (Matric) and above	13.83%	14.09%

Table 5 (cont.): Parental background: orphans vs. non-orphans

PANEL C: Other background indicators

	Mother and father alive, Wave 1 (1)	Mother and or father dead Wave 1 (2)
Young adult was born in Cape Town	46.4%	42.4%
Parents were ever married to each other	70.2%	68.5%

Notes to Table 5: The sample includes all young adults with valid observations in Wave 3, whose orphanhood status at Wave1 is known. Asterisks in column 2 indicate that the differences between the results in these column and those in column 1 are significant at 10 percent (*), 5% (**), and 1% (***) levels. Averages displayed are not adjusted by age. All statistics are computed using sampling weights adjusted for sample design and non-response, and standard errors are computed allowing for intracluster correlation.

Table 6: Time and material investments: orphans vs. non-orphans

	Indicators of time investments				Indicators of material investments			
	Spending night with young adult (Scale: 1-7)	Spending time (Scale:1-7)	Discussing personal matters (Scale:1-7)	Eating meals (Scale:1-7)	Money for school	Money for Clothes	Gifts	Pocket money
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Indicator: Father dead, Wave 1	-0.0169	-0.183	-0.0651	-0.317	-0.441**	-0.555***	-0.373**	-0.0440
	[0.148]	[0.222]	[0.112]	[0.213]	[0.184]	[0.186]	[0.159]	[0.201]
Indicator: Mother dead, Wave 1	-0.371	-0.202	-0.441*	-0.160	-0.360	-0.520	-0.526**	-0.580**
	[0.246]	[0.419]	[0.248]	[0.408]	[0.324]	[0.345]	[0.252]	[0.292]
Wald Test: Father dead = Mother dead p-value	0.213	0.972	0.166	0.754	0.833	0.934	0.612	0.157
Observations	1422	1423	1419	1420	1411	1418	1416	1416

Notes to Table 6: The sample includes all young adults with valid observations in Wave 3. Columns (1) to (4) display ordered probit estimates and those in columns (5) to (8) are based on probit regressions. Robust standard errors that allow for intracluster correlation displayed in brackets below each estimate. Regressions use sampling weights adjusting for sample design and non-response at the household and individual level. All regressions include sex and age indicators (Wave 3) as well as indicators that parental living status (mother is dead, father is dead) is unknown. Asterisks indicate that the differences between the estimates are significant at the 10 percent (*), 5 percent (**), and 1 percent (***) level.

Table 7: Change in the probability of Employment in Black Males, explained by different covariates

Dependent variable: Person is employed, Wave 3

Explanatory variables				
Indicator: Orphan(Wave1)*Age(Wave1)<=17	0.152* [0.0864]	0.162* [0.0920]	0.152* [0.0913]	-0.136 [0.1079]
Indicator: Orphan(Wave1)*Age(Wave1)>17	0.0285 [0.0451]	0.0212 [0.0487]	0.0157 [0.0449]	-0.184** [0.0765]
Index of time investments			-0.0199 [0.0991]	-0.0191 [0.0998]
Indicator: School fees paid			0.0498 [0.0742]	0.0381 [0.0750]
Index of material investments			-0.210** [0.0973]	-0.287*** [0.103]
Index of material investments*Orphan (Wave1)				0.343*** [0.141]
Observations	703	685	686	686
Controls for parental background?	No	Yes	No	No
Wald test: Background, p-val		0.1154		
Wald test: Time investments, p-val			0.8413	0.848
Wald test: Material investments, p-val			0.0555*	0.007***

Notes to Tables 7-9: The sample includes all male young adults with valid observations in Wave 3. Estimates of incremental effects are calculated based on a probit specification. Parental background controls are occupation and education indicator for the father and mother (including an indicator for missing information), as well as an indicator that parents were married to each other and an indicator that the young adult was born in Cape Town. Robust standard errors that allow for intracluster correlation are displayed in brackets, below each estimate. Regressions use sampling weights adjusting for sample design and non-response at the household and individual level. All regressions include age indicators (Wave 3) as well as indicators that orphanhod status (interacted with age group dummies) is unknown. Asterisks indicate that the differences between the estimates are significant at the 10 percent (*), 5 percent (**), and 1 percent (***) level.

Table 8: Change in the probability of earning low wage in Black Males, explained by different covariates

Dependent variable: Person is low wage earner (<3 rands/hr), Wave 3

Explanatory variables				
Indicator: Orphan(Wave1)*Age(Wave1)<=17	0.212 [0.186]	0.357 [0.230]	0.324 [0.216]	0.319 [0.310]
Indicator: Orphan(Wave1)*Age(Wave1)>17	0.104 [0.0771]	0.153* [0.0906]	0.112 [0.0739]	0.110 [0.140]
Index of time investments			-0.128 [0.121]	-0.128 [0.118]
Indicator: School fees paid			0.0193 [0.0932]	-0.0191 [0.0927]
Index of material investments			-0.211 [0.124]	-0.212 [0.128]
Index of material investments*Orphan (Wave1)				0.003 [0.146]
Observations	177	145	171	171
Controls for parental background?	No	Yes	No	No
Wald test: Background, p-value		0.002***		
Wald test: Time investments, p-val.			0.289	0.279
Wald test: Material investments, p-value			0.082*	0.162

Table 9: Determinants of wages in Black Males who are employed

Dependent variable: log wage earnings (rands/hr), Wave 3

Explanatory Variables					
Indic: Orphan(Wave1)*Age(Wave1)<=17	-0.446	-0.509*	-0.654**	-0.541*	-0.541*
	[0.291]	[0.301]	[0.288]	[0.310]	[0.312]
Indic: Orphan(Wave1)*Age(Wave1)>17	-0.104	-0.142	-0.141	-0.0823	-0.0821
	[0.105]	[0.0925]	[0.104]	[0.0883]	[0.0909]
Index of time investments			-0.0634		
			[0.228]		
Indicator: School fees paid			-0.0483		
			[0.134]		
Index of material investments			0.358		
			[0.223]		
Years of completed education, Wave 1				0.095***	0.090***
				[0.0259]	[0.0270]
Literacy and numeracy score, Wave 1					0.0005
					[0.0069]
Observations	181	180	175	180	176
R-squared	0.092	0.232	0.136	0.195	0.190
Controls for parental background?	No	Yes	No	No	No
Wald test: Background, p-value		0.010***			
Wald test: Time investments, p-val			0.782		
Wald test: Material investments, p-value			0.198		

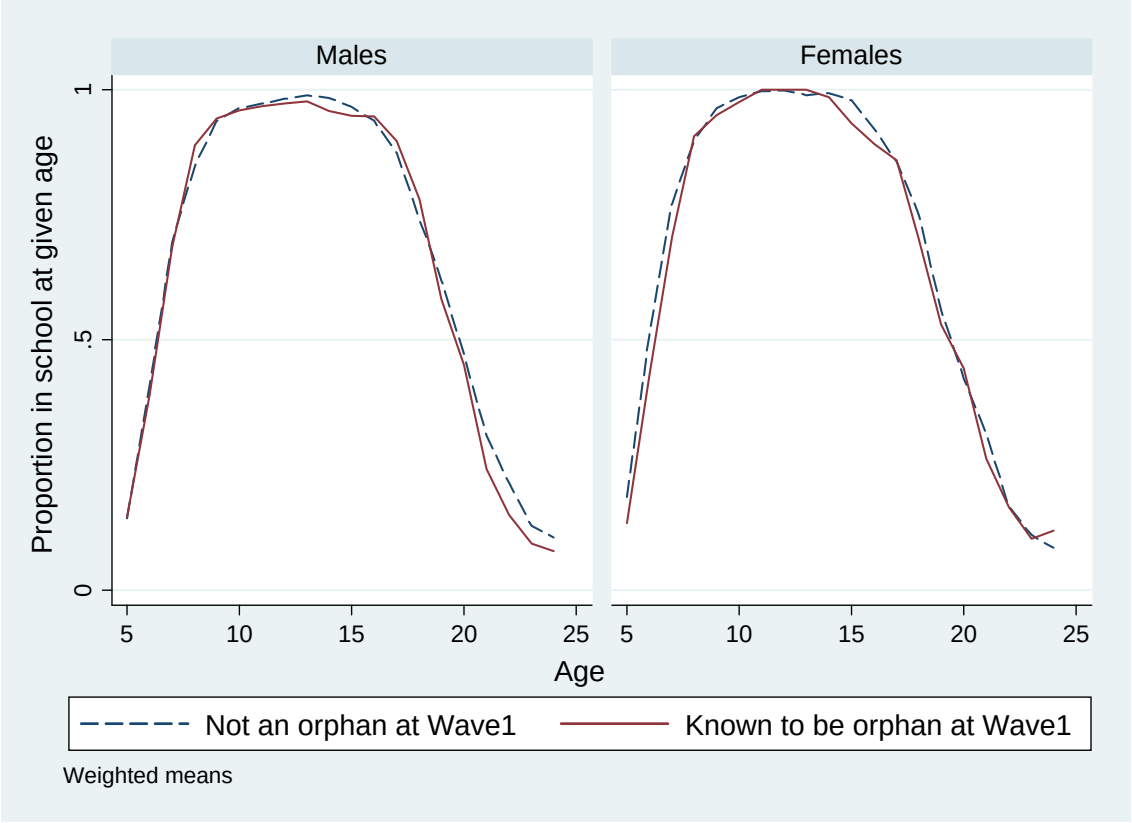
Table 10: Change in the probability of Childbearing in Black Females, explained by different covariates

Dependent variable: Person has ever given birth, Wave 3

Explanatory variables				
Indicator: Orphan(Wave1)*Age(Wave1)≤17	0.172*** [0.0622]	0.167** [0.0665]	0.141** [0.0623]	0.370*** [0.0986]
Indicator: Orphan(Wave1)*Age(Wave1)>17	-0.0206 [0.0515]	-0.0488 [0.0554]	-0.0286 [0.0544]	0.123 [0.0970]
Index of time investments			0.00231 [0.102]	0.0147 [0.105]
Indicator: School fees paid			-0.129* [0.0779]	-0.042 [0.0880]
Index of material investments			-0.124 [0.117]	-0.111 [0.1182]
Indic: School fees paid*Orphan (Wave1)				-0.229** [0.082]
Observations	743	734	727	727
Controls for parental background?	No	Yes	No	No
Wald test: Background, p-val.		0.045**		
Wald test: Time investments, p-val.			0.982	0.888
Wald test: Material investments, p-val.			0.001***	0.000***

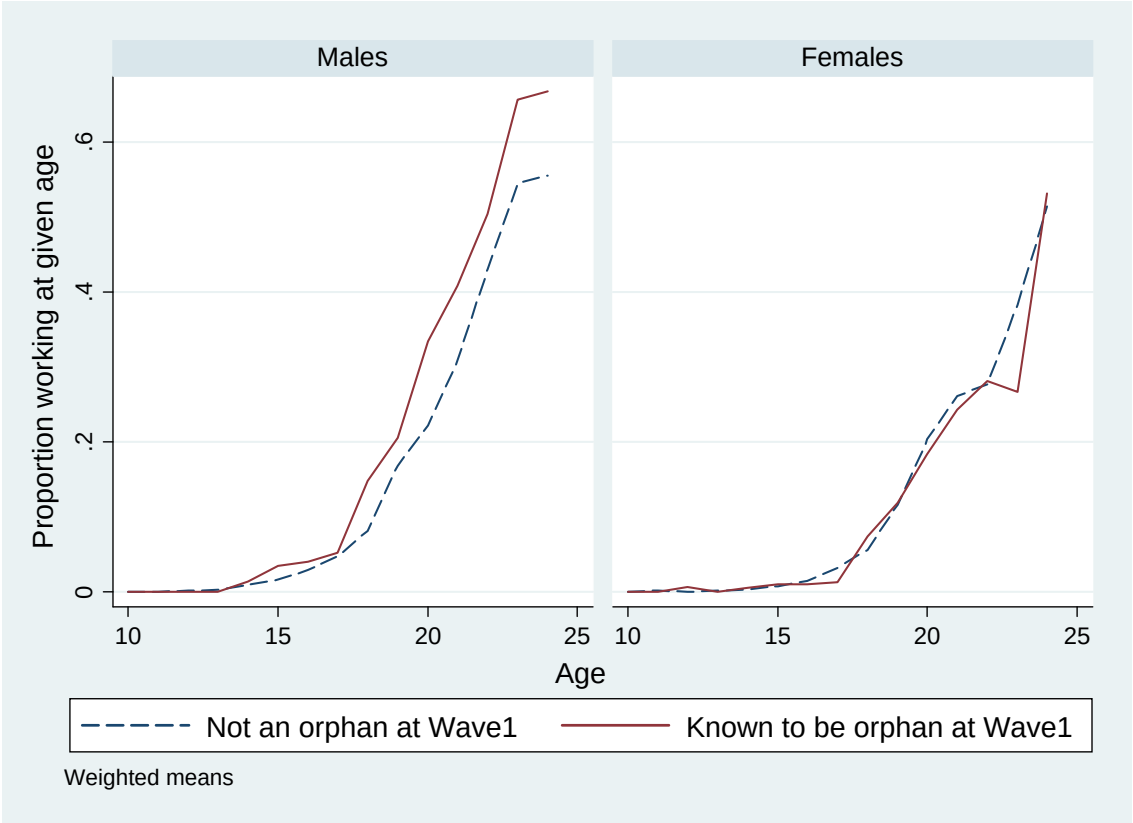
Notes to Table 10: The sample includes all female young adults with valid observations in Wave 3. Estimates of incremental effects are calculated based on a probit specification. Robust standard errors that allow for intracluster correlation are displayed in brackets, below each estimate. Regressions use sampling weights adjusting for sample design and non-response at the household and individual level. All regressions include age indicators (Wave 3) as well as indicators that orphanhod status (interacted with age group dummies) is unknown. Asterisks indicate that the differences between the estimates are significant at the 10 percent (*), 5 percent (**), and 1 percent (***) level.

Figure 1: Retrospective outcomes for African Young Adults in CAPS, based on calendar year information. School Enrollment



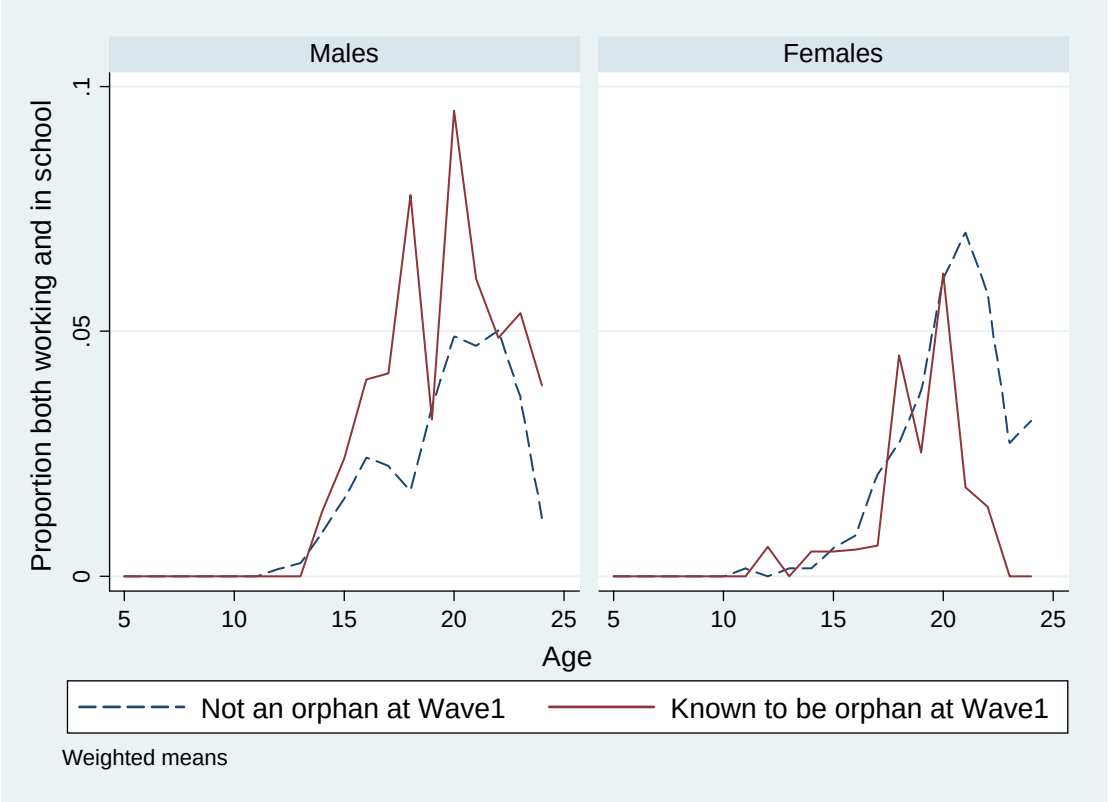
Notes: For each age, all individuals with complete calendar information for that age and whose orphanhood status at Wave 1 is known are considered. Notice that the comparison is between individuals who were orphans and those that were not at Wave1, and therefore the figures are not based on orphanhood status each age.

Figure 2: Retrospective outcomes for African Young Adults in CAPS, based on calendar year information. Employment



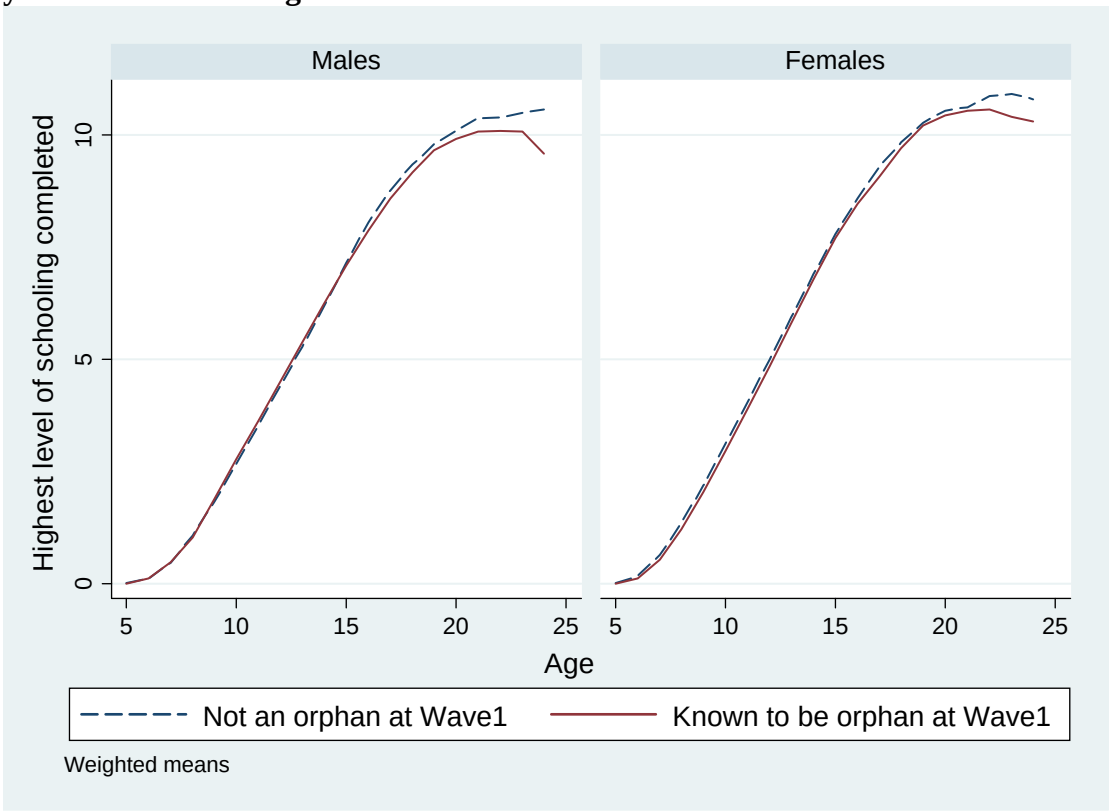
Notes: See Figure 1.

Figure 3: Retrospective outcomes for African Young Adults in CAPS, based on calendar year information. Person is both enrolled and working during a given calendar year



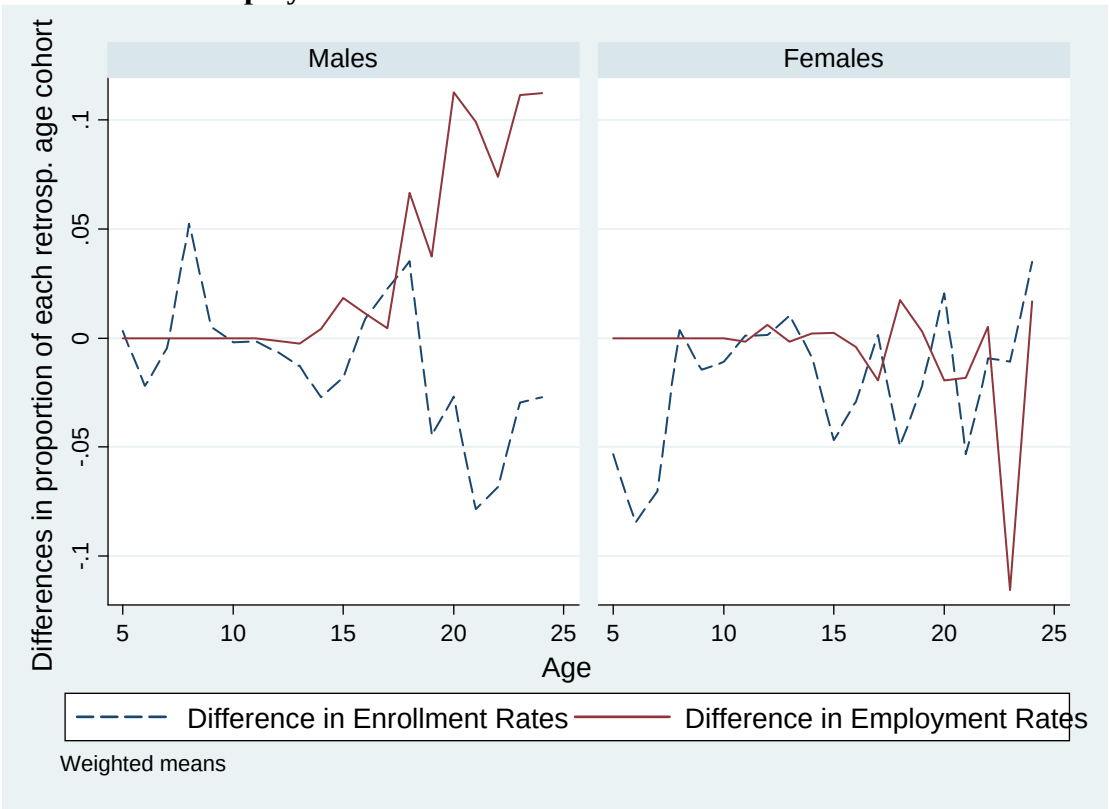
Notes: See Figure 1.

Figure 4: Retrospective outcomes for African Young Adults in CAPS, based on calendar year information. Highest education level achieved



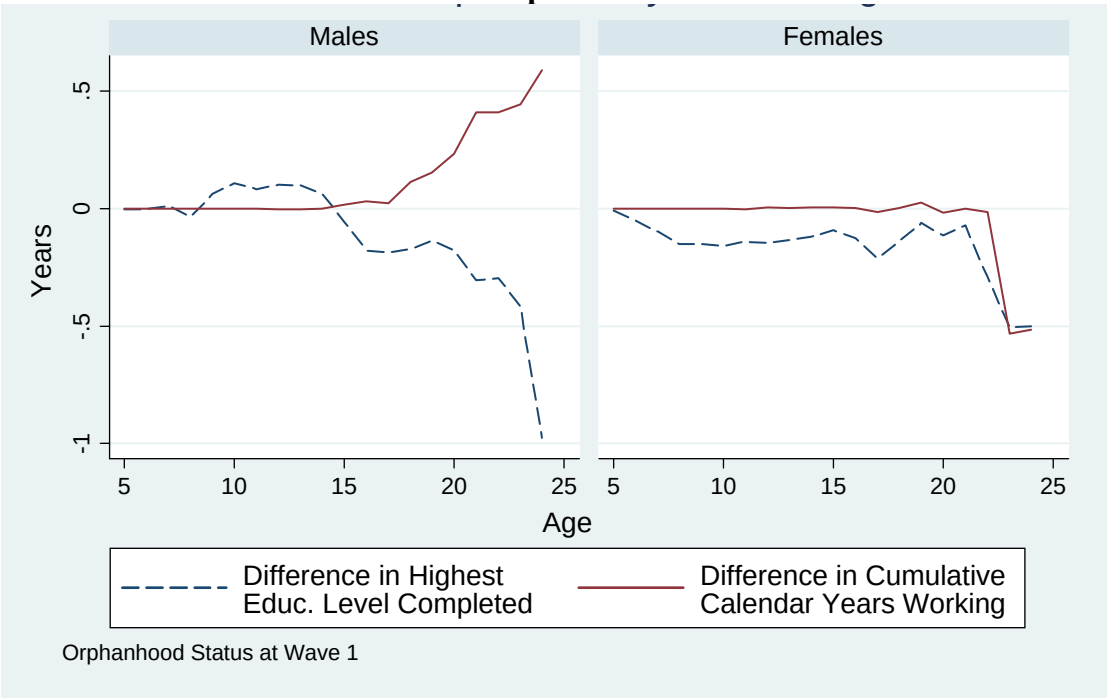
Notes: See Figure 1.

Figure5: Retrospective outcomes -Differences between orphans and non-orphans in enrollment and employment rates



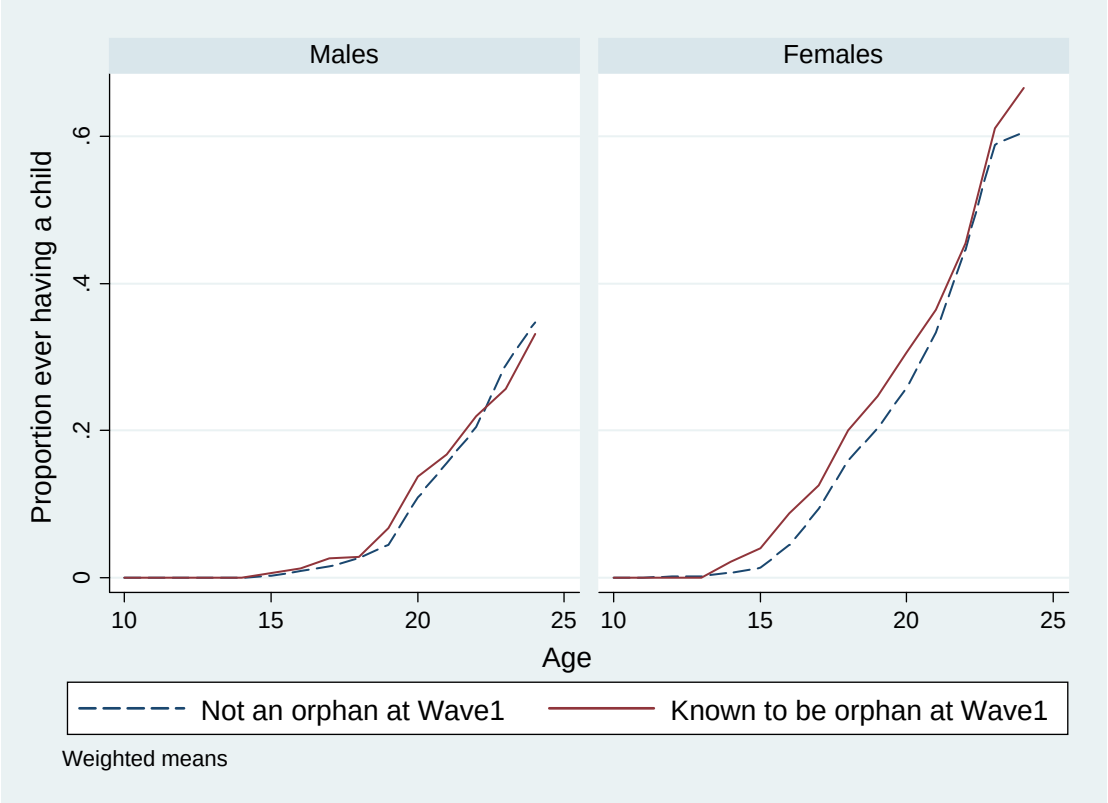
Notes: See Figure 1.

Figure6: Retrospective outcomes -Differences between orphans and non-orphans in educational achievements and work experience



Notes: See Figure 1.

Figure 7: Retrospective outcomes for African Young Adults in CAPS, based on calendar year information. Childbearing



Notes: See Figure 1.

Figure 8: Wave 3 - Nonparametric density estimates of wages earned, wage earners only.